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INSTALLATION COMMANDER

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Flying Operations

C-21 OPERATIONS PROCEDURES

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AFI 11-2C-21, Volume 3, C-21 Operations Procedures, Chapter 10, 1 September 1999, is supplemented as follows: This supplement sets forth procedures for all C-21A aircraft operating under the direction of the 375 AW. Send comments and suggested improvements to this supplement on the AF Form 847, Recommendation for Change of Publication, through channels to 375 OG/OGV, 433 Hangar Rd, Room 227, Scott AFB IL 62225-5029. The Commander, 375th Operations Group (375 OG/CC), has overall responsibility and waiver authority for this supplement. The extension of the paragraph number after "10" indicates the paragraph that is being supplemented. NOTE: To eliminate potential misunderstandings, the following definitions apply: Squadron delineates responsibility at the squadron level; Unit delineates responsibilities at the unit level, i.e., each squadron and geographically separated unit (GSU).

10.2.2. The 375 AW C-21 units will e-mail their next day's flying schedule, in addition to squadron requirements, to the Scott Command Post (SCP) (375AW.CP@scott.af.mil) by the close of business. (For weekends and holidays, the day-prior e-mail will include the nonduty days and the next duty day.) Units will notify the SCP of any mission changes for the current day's missions, as well as delays, cancellations, or any unusual circumstances. All units are responsible for accomplishing initial GDSS mission cuts and for closing out missions in GDSS during duty hours. The SCP will close out only those missions that terminate after duty hours.

10.2.2.2. Training missions. Request for Off-Station Trainer (OST) approval IAW procedures contained in the 375th Airlift Wing Operations Policy (WOP).

10.2.6.3.1. All 375 AW C-21 units will use the SCP for all CONUS C2 requirements. The SCP will flight-follow all 375 AW JOSAC missions and off-station trainers and will be the single point of contact for en route crews. Crews will contact the SCP at each en route stop as soon as possible after landing to report arrival/departure times, to receive messages, and to coordinate mission changes (i.e., crews will coordinate mission changes through SCP, who will, IN TURN , establish a phone patch with JOSAC). Crews will also call the SCP, prior to mission termination to determine if JOSAC has any additional lift requirements.

10.2.6.3.2. Crews operating OCONUS missions (includes trainers), will use TACC West Cell for all C2 requirements. To ensure an effective and efficient command and control process, TACC needs prompt notification of aircraft departures and arrivals. TACC initiates an overdue aircraft checklist when they cannot confirm aircraft arrival at the destination within 1 hour of ETA at OCONUS stations. If they do not receive a departure message, they consider an aircraft overdue at its destination when it exceeds the time limits above, based on the aircraft's estimated time of departure. If mission controllers are unable to confirm aircraft status within 1 hour, they request TACC Director of Operations (senior) approval to notify the appropriate rescue coordination center to begin an extended communications search. If communications capability is limited at the next destination, TACC recommends advising the controller that you will not contact them until the subsequent destination to prevent unnecessary initiation of the overdue aircraft checklist.

10.3.2.1. (Added) Crew Experience. Units will ensure all scheduled aircrews will have 400 hours PAA in the C-21A between the aircraft commander and copilot. IP's and above are exempt. The SQ/CC is the waiver authority.

10.3.1.5. (Added) Refer to AMCI 11-208, Tanker/Airlift Operations, for detailed ACM policies. Refer to AMCI 11-208 for detailed MEGP policies.

10.3.7.2. Heavy traffic commercial airfields are defined as those fields listed in AP-1 associated with Class B Airspace. Fields with known fueling delays are those listed in the IFR Supplement or ASRR, with remarks indicating that fueling delays can be expected. Planners should use 2+00 en route ground time at OCONUS locations.

10.3.8. Standby Force Duty:

10.3.8.1.1. Aircrews placed on ALPHA will be expected to launch within 1 hour of notification to launch. The crew should be billeted on base and should plan to obtain meals on base and maintain contact with SCP via pager or cellular phone. ALPHA crews are required to preflight their aircraft either (1) before entering 12-hour premission crew rest; or (2) after premission crew rest and prior to going to billeting. Unit commanders will determine which option to use based on mission requirements, crew availability, and LFA time.

10.3.8.1.2. Aircrews placed on BRAVO will be expected to launch within 2 hours of notification to launch.

10.3.8.1.2.1. (Added) The 375 AW maintains two C-21 aircraft and crews on continuous alert. One line is dedicated to Medevac missions (Scott/Randolph). The Priority Alert line is to support very short-notice requirements. Priority Alert is rotated between the GSUs IAW the 375 AW WOP. For Priority Alert, crews are LFA at 1500Z (1400Z during period of Daylight Saving Time (DST) daily; for Medical Alert, crews are LFA at 1600Z (1500Z DST). These alerts are normally for 24 hours. Units on Priority Alert and Medical Alert are expected to launch within 2 hours of notification for CONUS missions (3 hours for OCONUS missions).

10.3.8.1.2.2. (Added) Priority/Medevac alerts are JOSAC missions. All agencies requesting C-21 Alert support will contact JOSAC (including GPMRC Medevacs). JOSAC is responsible for initiating the alert and forwarding the JALIS Flight Advisory to the tasked units/crew. Due to unique host base arrangements, flights will develop locally approved procedures to execute alert missions. The JOSAC Execution Cell (576-6639) must be advised of any changes to unit alerting procedures.

10.3.8.1.2.3. (Added) When an alert crew is launched, the affected alert will not normally be reconstituted before the new crew is LFA the following day at the times listed in paragraph **10.3.8.1.2.1. (Added)** (or 1 hour after the expected return of the launched alert aircraft). Units may work with JOSAC to reconstitute earlier, if aircraft and crewmembers are available.

10.3.11. (Added) Commander's Observation Policy. Conduct the program IAW guidance in **Attachment 8**, this supplement.

10.4.2. The following procedures apply when maintenance is required at en route stations: (1) Contact the SCP when maintenance is required. The SCP will coordinate with JOSAC (if required) and can provide the crew a phone patch to the home-station contract maintenance personnel to determine the actions required to fix the aircraft. Crews may call Raytheon directly, but must keep the SCP informed as to mission status; (2) When maintenance problems result in delaying or diverting a JOSAC-scheduled mission, ensure JOSAC is advised at the earliest opportunity, so that alternate arrangements may be made for passengers.

10.4.2.1.1. (Added) Comply with 375 AW FCB for aircrew actions after a bird strike.

10.4.3.6. (Added) For waiver requests for items listed in AFI 11-2C-21, Volume 3, Chapter 4, ACs will contact the SCP. SCP will contact 375 OG/OGV, who will forward waiver requests to HQ AMC/DOV, the waiver authority. Be prepared to provide the following: (1) nature of maintenance problem; (2) Raytheon's guidance regarding the problem; (3) nature of mission (high priority; (4) pre/depositioning, etc); (5) remaining crew duty day; (6) crew experience; (7) and departure/arrival weather.

10.4.5. "En Route" is defined as those locations where contract maintenance is not available.

10.4.6. (Added) Table 4.1., Minimum Equipment List.

10.4.6.1. (Added) Spoilers (Flight Mode). Inoperative spoilers in flight require cruise operations at or below FL250 for emergency descent compliance.

10.4.6.2. (Added) Ground Proximity Warning System (GPWS). Required for night TAA/D maneuvers.

10.4.6.3. (Added) Radio Altimeter. Required for night TAA/D maneuvers.

10.5.1. The Abbreviated Flight Crew Checklists will be carried in its entirety and not broken down into separate sections (i.e., a Normal Procedures Checklist and an Emergency Procedures Checklist).

10.5.1.1. Additional pages will not be inserted between Flight Crew Checklist pages. The only approved checklist insert is the 375 AW In-Flight Guide (IFG); other pages may be kept separate from the IFG, but must be marked "For Reference Only."

10.5.1.2. (Added) Normally, the pilot in the right seat will operate the landing gear. Actuate the landing gear upon command of the pilot flying the aircraft and acknowledgement by the other pilot. The pilot not flying the aircraft should normally operate the flaps. Actuate the flaps upon command of the pilot flying the aircraft, acknowledge the flap setting commanded, and visually confirm the flap gauge indicates the desired setting. Instructors may operate the flaps as required.

10.5.4.3. (Added) The ACs will make all takeoffs and landings for the first 50 hours since certification when flying with a FP or MC. Unit CC is the waiver authority for prior-qualified pilots (PQPs).

10.5.4.4. (Added) Per HQ AMC FCIF 96-10-10, multiple approaches and touch-and-go landings may be flown on JOSAC missions. The following procedures will be followed:

10.5.4.4.1. (Added) AC must be IP/EP qualified to perform touch-and-go training.

10.5.4.4.2. (Added) Transition training will not be accomplished with passengers on board.

10.5.4.4.3. (Added) All transition training will be accomplished during the first 12 hours of the flight duty period.

10.5.4.4.4. (Added) Training may be accomplished at en route locations during JOSAC missions providing:

10.5.4.4.4.1. Mission supports no higher than a DV-6.

10.5.4.4.4.2. Training is accomplished at a base with C-21 Raytheon maintenance.

10.5.4.4.4.3. The base where training is to take place has a spare aircraft available with which to continue the mission, if necessary.

10.5.4.4.4.4. The crew returns to parking 2 hours prior to scheduled departure.

10.5.4.4.5. (Added) Training may also be accomplished after the last leg of regular JOSAC missions (or after the last en route stop, if duty passengers are not scheduled to be carried on the last leg and the crew confirms with JOSAC that there are no additional mission requirements for the crew.) Training will take place only at fields approved by the unit CC/DO or on file with the 375 OG/OGV.

10.5.4.4.6. (Added) The AC will obtain approval to conduct transition training from the home unit DO/CC and obtain training mission number(s) for use PRIOR to mission departure.

10.5.4.4.7. (Added) Home unit current operations will recut the mission to add the training mission numbers in GDSS/C2IPS.

10.5.4.4.8. (Added) Upon arrival at the training location, the crew will close out the current line on the AFTO Form 781, AFORMS Aircrew/Mission Flight Data Document, and log the training time on the next line using the appropriate mission number and symbol. (The crew may elect to either (1) close out the current AFTO Form 781 line in-flight and continue with the training portion; or (2) full stop and then begin the training portion.)

10.5.4.4.9. (Added) For 26PX missions, only paragraphs **10.5.4.4.1. (Added)** through **10.5.4.4.3. (Added)** apply.

10.5.4.4.10. (Added) The autopilot may be used on a coupled approach down to MDA, DH or 200’ AGL, whichever is greater.

10.5.11.1. The pilot not flying will acknowledge the altitude clearance from ATC, set that altitude in the Altitude Alerter Window and verbally state the altitude. Then, the pilot flying will verify by verbally stating the altitude. If the pilots disagree, ask ATC for verification of the altitude clearance.

10.5.15.3.4. (Added) Minimum recommended taxiway width is 40 feet IAW HQ AMC Airfield Suitability and Restrictions Report (ASRR).

10.5.15.4. Airfield Suitability and Restrictions Report (ASRR). Units conducting operations into the Central or South American Theaters will comply with the following theater restrictions:

10.5.15.4.1. (Added) The AC will have 300 hours MP time in the C-21A.

10.5.15.4.2. (Added) MP time includes OME.

10.5.15.4.3. (Added) MP time does NOT include FP time.

10.5.15.4.4. (Added) IP/EPs are NOT excluded from the MP time requirement.

10.5.15.4.5. (Added) The AC must have previously operated in the respective theater as a crewmember in the C-21A. EXCEPTION: The AC restriction does not apply if the copilot is a least an MP or higher who has operated in the respective theater in the C-21A; however, the AC hours restrictions cited above must still be met.

10.5.15.4.2. (Added) The 375 OG Certification Airfields. The 375 OG supplements those certification airfields cited in Part One of the ASRR with the following list:

Table 5.15. Supplemental OG Certification Airfields

Eagle County Regional, CO	Kodiak, Alaska
San Diego Intl-Lindbergh Field, CA	
Toncontin Int'l, Honduras (Tegucigalpa)	Mariscal Sucre, Ecuador (Quito)

Prior to operating into any of these airfields, the AC must have first actively monitored a takeoff and approach in the C-21A in order to obtain certification. EXCEPTION: The AC restriction does not apply if the copilot is a least an MP or higher who has operated into the respective field in the C-21A. Waiver authority for the above airfields is 375 OG/CC.

10.5.15.5. Aircrews must takeoff/land beyond unrecessed cable barriers and ensure adequate takeoff/landing distance is available before any unrecessed departure end arresting cable.

10.5.21.2.2.1. (Added) Functional Check Flight (FCF) Pilot Checkout. Squadron/Flight Commanders will review the qualifications of assigned and attached crewmembers and will select only highly qualified individuals to perform FCFs. The FCF qualified pilots will be trained IAW the FCP Training Program outlined in **Attachment 2**, this supplement. When training is complete, place this document in the left side of the individual's Flight Evaluation Folder (FEF) and log certification on an AF Form 1381, USAF Certification of Aircrew Training.

10.5.25. (Added) Obstacle Climb Procedure. When takeoff climb performance is at the minimum required to meet the required published climb gradient or 3.3 percent (whichever is greater), crews will accomplish the following on takeoff:

10.5.25.1. (Added) Takeoff normally and retract the gear.

10.5.25.2. (Added) Maintain flaps 8 degrees and pitch approximately 15 degrees* to maintain less than 200 KIAS until clear of the obstacle or altitude restriction is met. NOTE: *Do not exceed 20 degrees pitch or allow speed to decrease below V_2.

10.5.25.3. (Added) Be prepared to assume V_2 airspeed in the event of an engine failure to ensure TOLD calculated climb performance is achieved.

10.5.25.4. (Added) Once clear of the obstacle or altitude restriction is met, retract flaps and resume normal speeds.

NOTE: Refer to paragraphs **10.6.16.** and **10.6.17.** of this supplement for detailed departure and climb gradient considerations.

10.6.3. See **Attachment 5**, 375 AW Guide to OCONUS Operations, and **Attachment 6**, C-21 High Altitude Airfield Operations.

10.6.4. Table 6.1. Publication Requirements (Added). The AC will carry the Flight Crew Bulletin (FCB) on all missions.

10.6.6.1. (Added) The aircraft commander will sign off his/her AMC Form 396, Flight Crew Information File (FCIF) Currency Record, IAW AFI 11-2C21 Volume 2/AMC1, to document the Intel briefing.

10.6.10. Mission Kits. Squadrons/flights will ensure mission kits contain the following items, as a minimum:

DD Form 2131, Passenger Manifest

AF Form 70, Pilot's Flight Plan and Flight Log

AFTO Form 781, AFORMS Aircrew/Mission Flight Data Document.

AF Form 4040, C-21A TOLD Card or AMC Form 23 C-21A TOLD Card

375 OGV Tab Data Sheets

AMC Form 97, AMC Unusual Occurrence/Bird Strike Worksheet

DD Form 1351-2, Travel Voucher

AF Form 15, United States Air Force Invoice

AF Form 315, United States Air Force Avfuels Invoice

AF Form 457, USAF Hazard Report

AF Form 651, Hazardous Air Traffic Report (HATR)

AMC Form 54, Aircraft Commander's Report on Services/Facilities

Mission Itinerary

375 AW ORM Worksheet

Mission Accomplishment Report (MARs) Sheet

375 OGV Departure Flow Chart (**Attachment 7**)

NOTE: Individual units may add additional items to this list as desired.

10.6.10.5. (Added) Aircraft Publications. Units will ensure the following publications are carried on board each aircraft:

10.6.10.5.1. (Added) HQ AMC Airfield Suitability Report and Restrictions (ASRR).

10.6.10.5.2. (Added) Area Planning 1 (AP-1).

10.6.10.5.3. (Added) General Planning (GP).

10.6.10.5.4. (Added) 375 OG OSA Passenger Handling Guide.

10.6.10.5.5. (Added) TACC Pamphlet.

10.6.10.5.6. (Added) AMCI 11-208, Tanker/Airlift Operations.

10.6.12.1. Use "Mission Briefing Guide" in the 375 AW IFG.

10.6.13.3. The Reach 02 Call Sign will be used by the HQ AMC/CV.

10.6.15.5.1. (Added) TOLD departure information will be completed in its entirety prior to engine start. All blocks must be filled in – those factors which are insignificant for given conditions (RCR, Crosswind, Headwind) may indicate reviewed or N/A with a dash or check mark.

10.6.15.5.2. (Added) TOLD arrival information must be completed in its entirety prior to initiating descent from en route cruising altitude. All blocks must be filled in those factors which are insignificant for given conditions (RCR, Crosswind, Headwind) may indicate reviewed or N/A with a dash or check mark.

10.6.16. Departure Planning IAW AFI 11-202V3, General Flight Rules, AFMAN 11-217, Instrument Flight Procedures, this instruction, and MAJCOM supplements.

10.6.16.1. Gross Weight (GW). Ensure the aircraft does not exceed flight manual weight limitations. GW may be further restricted by operating conditions including icing, temperature, pressure altitude, runway length and slope, minimum climb gradients, and obstacles.

10.6.16.2. Departure Routing/Climbout Performance. When considering climb gradient calculations, use single engine performance data for obstacle clearance and two engine data for ATC gradients. Appropriate terrain charts must be reviewed prior to departure. This review will reveal general terrain conditions and should not be used as a primary means of determining obstacle clearance. Before flight into a field, ensure the field has a published instrument approach. This clearance indicates the field has been surveyed for obstacles. If there is no instrument approach at the field, you may not depart IFR. There are four methods available to depart a field IFR. They include: Radar Vector Departures (Specific ATC Instructions), IFR Departure Procedures (IDPs: Commonly referred to as "Trouble-T" Procedures), Standard Instrument Departures (SID), and Diverse Departures. Regardless of the type of departure flown, the aircraft must climb runway heading to 400' AGL before turning (unless otherwise noted) AND ensure obstacle clearance with one engine inoperative. If no minimum climb gradient is published, maintain at least 200'/NM climb gradient with all engines operating and 152'/NM for one engine inoperative. (See NOTE below.) If a higher required climb gradient is published, maintain at least that climb gradient as the minimum with all engines operating and use that climb gradient minus 48'/NM as the minimum with one engine inoperative. (See NOTE below.)

NOTE: Maintaining this additional 48'/NM buffer is recommended, as subtracting the TERPs designated 48'/NM assures zero inches obstacle clearance with a Critical Engine Failure at V1 on a runway that is equal to Critical Field Length.

10.6.16.2.1. Standard Instrument Departures (SID). OPRs for SIDs are identified near the top center of the page for each SID. OPRs can be the Federal Aviation Administration (FAA), United States Army (USA), United States Navy (USN), United States Marine Corps (USMC), or United States Air Force (USAF). There are three possible gradients to be maintained when flying a SID:

10.6.16.2.1.1. (Added) If a SID gradient is published on the SID, meet at least that gradient.

10.6.16.2.1.2. (Added) If there is no published SID gradient and no "Trouble-T" exists, maintain at least 200'/NM for the duration of the SID.

10.6.16.2.1.3. (Added) If there is no published SID gradient, but a "Trouble-T" gradient exists, maintain at least the "Trouble-T" gradient.

10.6.16.2.2. Published IFR Departure Procedures (IDPs or "Trouble-Ts"). Published IFR Departure Procedures assist in avoiding obstacles during the departure climb to the minimum en route altitude (MEA). Airfields with Published IFR Departure Procedures will have the inverted triangle with a white "T" symbol ("Trouble-T") printed on the approach plates and/or SIDs. When using Jeppesen Publications, IFR Departure Procedures will be listed on the airfield diagram page, typically located on the reverse side of the airport's first approach. A climb gradient and/or specific routing and/or alternate takeoff weather min-

imums will normally be specified with a Published IFR Departure Procedure. When flying a Published IFR Departure Procedure depicted routing and climb gradients must be flown and met to ensure obstacle clearance. (See paragraph **10.5.25. (Added)**, Obstacle Climb Procedure and Section **10.6.17.**, Obstacle Clearance Planning.)

NOTES:

1. When the published IDP includes alternate takeoff weather minimums, additional information must be present to depart IFR. An AMC authorized and published IFR Departure Procedure must allow AMC aircraft to depart using MAJCOM "standard" weather minimums; this is indicated by the term "Standard" or "Or Standard" in conjunction with the alternate (See and Avoid) takeoff weather minimums. If this additional information is not present, an IFR departure from that runway is not authorized. (EXCEPTION: An IFR departure is authorized when flying a published graphically depicted departure procedure (a SID), with a published climb gradient depicted on the SID.) For example, Eagle County, Colorado has the following IDP weather minimums:
   EAGLE, CO
   EAGLE COUNTY REGIONAL…….Rwy 7, 5300-3*
   Rwy 25, 5300-3**
   * Or 800-2 with minimum climb of 650'/NM to 11,800.
   ** Or 1700-3 with minimum climb of 750'/NM to 11,200.
   In this case an IFR departure is NOT AUTHORIZED; even though a climb gradient is specified and a routing (not depicted in example) is provided, the departure still requires the use of UNAUTHORIZED "See & Avoid Minimums."
2. Obstacles under 200' AGL may require manual gradient computation that must be met as TERPs designers are not required to compute a climb gradient for close-in obstacles. This does not absolve crews from having to clear "NOTED" obstacles. For example, San Diego's Lindbergh Field has the following IDP:
   SAN DIEGO, CA
   SAN DIEGO INTL-LINDBERGH FIELD
   Rwy 9, CAT A, B, 900-2*
   Rwy 9, CAT C, D, 1600-2*
   Rwy 27, 400-1**
   * Or standard with minimum climb of 570/NM to 600.
   ** Or standard with minimum climb of 260/NM to 400.

NOTE: Rwy 9 150' trees and buildings 800' from departure end.

Assuming the aircraft is taking off from Rwy 9 the TERPs specialist stated that the flight crew must meet a 570/NM to 600 climb gradient. The NOTE applies to close-in obstacles under 200'AGL and the TERPs specialist will not publish a higher than standard climb gradient if it is not required to at least 200' AGL. If the flight crew do the math here, they would see that an 873'/NM climb gradient is required just to clear the obstacles in the NOTE if the aircraft cross the departure end of the runway at 35'.

"The math": Obstacle Height = 150' – 35' (DER crossing ht) = 115' AGL

Obstacle Distance = 800': 800'/6076' (feet per NM) = .1316 NM

Climb Gradient = 115'/.1316 NM = 873 ft/NM or 14.4 % (873/6076 x 100)

In this case, the AC must ensure the aircraft can meet the manually calculated climb gradient to ensure obstacle clearance.

10.6.16.2.3. Radar Vector Departures. Radar Vector Departures, i.e., Specific ATC Departure Instructions, may be flown with several limitations. If a published climb gradient exists for the planned departure runway, it must be met. The required gradient will be the highest of 200'/NM, as published by the "Trouble T," or as published on the SID. Radar Vector Departures will not be flown in lieu of meeting published climb gradients. Some radar vector SIDs have restrictive Trouble-T's associated with them; ensure compliance with Section **10.6.16.2.2.**, Published IFR Departure Procedures and NOTES 1 and 2 below.

NOTES:

1. The aircrew is responsible for obstacle clearance until a radar vector is issued. The term "Radar Contact" means only the aircrew has been identified on radar and does not mean that ATC assumes obstacle clearance responsibility. Obstacle avoidance responsibility is shared between ATC and the aircrew once a radar vector is issued (e.g., "Swift 51, radar contact, turn left heading 090" or "Smoky 23, fly present heading, climb and maintain 10,000").
2. If a vector SID depicts a Trouble-T, then the associated restrictions apply. A radar departure from a runway that uses nonstandard "see and avoid" weather minimums will have an obstacle in the departure path. If standard minimums are not authorized then a standard IFR departure from that runway is NOT AUTHORIZED. In such a case, the Alternate IFR Departure Method (AIDM - see para 10.16.6.2.5.) is the only AMC-approved IFR departure method and requires a climb in VMC using VFR cloud clearances to an IFR MEA (and compliance with all obstacle avoidance planning).

Example: BIRMINGHAM THREE DEPARTURE (VECTOR): BIRMINGHAM, AL

BIRMINGHAM INTL

Rwy 6, 800-6*

Rwy 18, 800-4**

Rwy 36, 800-2

* Or standard with minimum climb of 360/NM to 1700.

** Or standard with minimum climb of 340/NM to 1700.

The above example lists the IDP associated with the Vector SID. Although there is no minimum climb gradient published on the SID, there is an IFR departure procedure published. In this case to depart Runway 6, you may follow the Specific ATC Departure Instructions (tower-provided departure instructions). However, you must meet or exceed 360' per NM, until reaching 1,700' MSL according to the IFR departure procedure. If you receive the same clearance for RWY 36 at Birmingham, then you may not depart under IFR (except by the AIDM; see Section **10.6.16.2.5. (Added)**, Alternate IFR Departure Method) since RWY 36 only has nonstandard takeoff weather minimums published. Why not depart from RWY 36? Because ½-mile from the departure end, there is a 231'AGL ridgeline (not depicted) that would require a climb gradient of 396'/NM!

10.6.16.2.4. Diverse Departures. In the absence of SIDs, IFR Departure Procedures, and Radar Vector Departures, a Diverse Departure may be flown. These departures require you to maintain runway heading

until 400’ AGL and past the departure end of the runway before turning in the shortest direction on course while maintaining a 200’/NM climb gradient up to the IFR MEA. If the field has been reviewed by the US Navy (USN), you may not depart via a Diverse Departure (DD). Additionally, DDs are not authorized at OCONUS fields, which have been reviewed by the US Army (USA). If there is a published IFR departure climb gradient or routing, you cannot use a Diverse Departure and must meet the IFR Departure Procedure Requirements.

10.6.16.2.5. (Added) Alternate IFR Departure Method (AIDM). If you are unable to depart using one of the previous four methods (6.16.2.1. through 6.16.2.4.), consider downloading fuel, cargo, or waiting for climatological conditions to improve. If these actions will not assist in departure, the AC may consider using the Alternate IFR Departure Method. This method requires extensive planning by the AC and extra time may be needed to accomplish required items. This is an IFR departure using Visual Flight Rules (VFR) cloud clearances in VMC and all of the following conditions must be met:

10.6.16.2.5.1. (Added) Day/VMC exists for the entire emergency return route and departure route to an IFR MEA using VFR cloud clearances.

10.6.16.2.5.2. (Added) All engines operating meets the greater of 200’/NM or the published gradient; engine out operations meets the greater of 152’/NM or the published gradient, minus the 48’/NM TERPs buffer.

NOTE: Two-engine climb performance will always be more than double the engine-out climb performance. This is due to twice the thrust and a reduction in drag associated with two engines operating versus one engine operating and one engine windmilling. For example, if the aircraft is capable of an engine-out climb gradient of 2.5 percent, the two-engine climb gradient will always be 5.0 percent or greater. (This information provided by Learjet Engineering).

10.6.16.2.5.3. (Added) The AC, after thorough analysis (using applicable obstacle height and distance information from available sources including the airfield manager, base operations, JOGs, TPCs, sectionals, etc.,) determines that in the event of engine failure, the planned departure and emergency route allow for obstacle clearance.

10.6.16.2.5.4. (Added) The emergency route back to the departure field or to the alternate departure field must be planned and briefed to the entire crew.

10.6.16.2.5.5. (Added) If an engine failure occurs, aircrews planning to continue their filed departure procedures must advise ATC if they are unable to meet the published ATC or obstacle climb gradient.

10.6.16.2.6. VFR Departures. VFR departures are authorized when required for mission accomplishment. The weather at takeoff must permit a VFR climb to an IFR MEA, appropriate IFR cruising altitude or altitude where radar vectors can be provided. Guidance specified in the Alternate IFR Departure Method (AIDM), Sections (**10.6.16.2.5. (Added)** through **10.6.16.2.5.5. (Added)**) must be met.

NOTES:

1. The minimum single engine climb gradient will be 2.5 percent.
2. Day VFR Departures must clear all obstacles laterally or vertically.
3. Night VFR Departures must clear all obstacles vertically.

4. A pilot departing VFR with the intentions of obtaining an IFR clearance en route, must be aware of the position of the aircraft and the relative terrain/obstructions and airspace. Pilots are responsible for their own terrain/obstruction clearance until reaching the MEA/MIA/MVA/OROCA.
5. In no case will VFR departures be flown in lieu of obstacle clearance planning.

10.6.17. Obstacle Clearance Planning: In accordance with AFI 11-202V3, AFMAN 11-217, this instruction, and MAJCOM supplements.

10.6.17.1. Begin collecting obstacle information during initial mission planning. Obstacle identification consists of those objects that penetrate an OIS (Obstacle Identification Surface) of 40:1 (152'/NM). The surface begins at the departure end of the runway (DER) at 0' (or otherwise noted) for USAF and USN fields and at 35' for civil and USA fields. Calculation of the OIS continues until reaching an MEA. Climb gradients of 200'/NM will provide at least 48'/NM clearance above all obstacles that do not penetrate the OIS. Published climb gradients found on a SID or IFR Departure Procedure will provide at least 48'/NM clearance above all obstacles that penetrate the OIS. The AC must be aware of and thoroughly brief the crew on all obstacles along the planned departure. (See Figure 6.1., "Obstacle Identification Surface" of AFI 11-2C-21, Volume 3, for a graphic depiction of TERPs Criteria.)

Figure 10.6.1.

Obstacle Identification Surface. See Figure 6.1., "Obstacle Identification Surface" of AFI 11-2C-21, Volume 3, for a graphic depiction of TERPs criteria.

10.6.17.1.1. The Airfield Suitability and Restrictions Report (ASRR) is an anecdotal source of obstacle information and is not a stand-alone document. It is intended to advise aircrews of possible obstacle information that was not officially surveyed.

10.6.17.1.2. Aircrews may call HQ AMC/DOVS for additional airfield obstacle data at DSN 576-3112.

10.6.17.2. Objects penetrating the OIS may or may not be depicted on Approach Plates and SIDs. Generally, objects that do not penetrate the OIS will not be depicted. Regardless, these depictions are unsuitable for obstacle clearance calculations.

10.6.17.3. SIDs are merely ATC procedures which were later surveyed to ensure obstacle clearance and safe routing to the en route structure. In other words, SIDs are designed primarily to get the departing aircraft efficiently into the en route structure; obstacle avoidance is generally a secondary emphasis determined only after the most efficient routing is designed. SIDs should not be used as the sole source of obstacle information for departure planning. If used as such, inadequate (engine out) obstacle clearance information may result.

10.6.17.4. The controlling obstacle is defined as the obstacle requiring the greatest climb gradient within the flight path. Obstacles are not normally depicted on SIDs when climb gradients of less than 152' per NM are required to clear them.

10.6.17.5. To fly any IFR departure, aircrews must ensure they can meet the published/required climb gradient for the planned departure with all engines operating. In addition, aircrews will accomplish the following to ensure they can vertically clear all obstacles on the climbout/emergency return flight path with one engine inoperative:

10.6.17.5.1. Use the most restrictive of the following to determine whether engine-out climb performance is sufficient to provide obstacle clearance:

10.6.17.5.1.1. Using applicable obstacle height and distance information from available sources (airfield manager, base operations, JOGs, TPCs, sectionals, etc.) to ensure engine-out climb performance is sufficient to vertically clear obstacles which are on or reasonably close to the planned departure and emergency return flight path. If the actual engine-out capability is less than the required obstacle gradient, comply with paragraph **10.6.16.2.5. (Added)**

10.6.17.5.1.2. If a climb gradient is published for the planned departure, attempt to meet that gradient engine-out. If you cannot meet that gradient engine-out, you may subtract 48'/NM from the published climb gradient. (See NOTE below.) If the climb gradient is published in a feet per minute table, reference the "60 Knots" Column. This column is the same as feet per NM. If the actual engine-out capability is less than the required climb gradient, comply with paragraph **10.6.16.2.5. (Added)**

NOTE: Maintaining this additional 48'/NM buffer is recommended, as subtracting the TERPs designated 48'/NM assures zero inches obstacle clearance, with a Critical Engine Failure at V1 on a runway that is equal to Critical Field Length.

10.6.17.5.1.3. Departure gradient restrictions apply to initial departures, touch and go's, and anytime your aircraft proceeds past the Missed Approach Point (MAP). When your aircraft goes below the published Minimum Descent Altitude (MDA) or is past the MAP, the published missed approach will not guarantee obstacle clearance. For this reason it is necessary to meet all the same requirements of initial departures during touch and goes. It is prudent to review these requirements prior to any approach, in case of a go-around or balked landing. Many airfields have increased (greater than 2.5 percent) missed approach climb gradients that must be met as well. For these reasons, calculating a performance climb gradient at your destination or transition airfield is necessary.

NOTE: Two-engine climb performance will always be more than double the engine-out climb performance. This is due to twice the thrust and a reduction in drag associated with two engines operating versus one engine operating and one engine windmilling. For example, if the aircraft is capable of an engine-out climb gradient of 2.5 percent, the two-engine climb gradient will always be 5.0 percent or greater. (This information provided by Learjet Engineering.)

10.6.17.6. If an engine failure occurs, aircrews planning to continue their filed departure procedures must advise ATC if they are unable to meet the published ATC or obstacle climb gradient.

NOTE: See **Attachment 7** for a synopsis of paragraphs **10.6.16.** through **10.6.17.**

10.6.21.4. Due to potential personnel hazard when lightning is reported within 5 NM of the airfield, aircrews will depart the flight line and seek suitable cover, or enter the aircraft until lightning is no longer within 5 NM. No passenger/patient loading, refueling, fleet servicing or maintenance will be performed under these conditions.

10.6.21.6.3.1. Mountain wave turbulence usually occurs on the downwind side of mountain ranges, and may be indicated by the presence of rotor or standing Lenticular Clouds. Refer to AFH 11-203, Volume 1, Weather for Aircrews, for an in-depth discussion of this phenomenon. Crews should use good judgment when flying into any area conducive to mountain wave turbulence.

10.6.21.7.1. (Added) Correlation Between Freezing Precipitation and the Level of Icing. After consultation with the Air Force Weather Agency and HQ AMC/DOW, aircrews should be aware of the following: In accordance with Air Force Weather Agency Technical Note (AFWA/TN) 98/002, Meteorological Techniques, 15 July 1998, observed or forecast freezing drizzle correlates to 'moderate icing.' Freezing rain correlates to 'severe icing.' According to HQ AMC/DOW, military forecasters should NOT issue a fore-

cast for severe icing when the forecast calls for freezing drizzle. But if the forecaster insists on calling for severe icing with freezing drizzle, then the crew should consider the icing to be severe. (NOTE: Other agencies (e.g., other services and National Weather Service) may not restrict forecasters from calling for severe icing with freezing drizzle in the forecast. If their forecast is for severe icing, consider it so.)

10.6.24. Aircraft Fuel Purchase. Aircrews will comply with the procedure outlined in the IFR Supplement (extract below from the US IFR Supplement): Fuel available through US Military Base Supply, Into-Plane Contract and/or reciprocal agreement is listed first. Military fuel entry is followed by (Mil). Where contract fuel is available, the name of the refueling agent is shown. Military fuel should be used first if it is available. When military fuel cannot be obtained but contract fuel is available, government aircraft should refuel with the contract fuel to avoid potential disputes with into-plane contractors. Fuel not available through the above is shown preceded by NC (no contract) and enclosed in parentheses. Should there be any question as to whether a contract exists, at an individual airport location, DFSC/PH Fort Belvoir, VA, can be contacted by telephone via DSN 427-8489 or COMM 703-767-8489. NOTE: The US Government National Credit Card (SF 149) is not a valid instrument to obtain fuel under a DFSC Into-Plane Contract. The Jet Fuel Identaplate, DD Form 1896 is the only acceptable plate for use in documenting into-plane contract fuel purchases.

10.6.28.1.6. Operational Procedures in Support of Distinguished Visitors (DVs). To expedite blockout when carrying DVs, crews should be ready to start engines (i.e., clearance to start and checklists complete) 30 minutes prior to scheduled departure time. Attempt to confirm the impending arrival of the DV as appropriate.

10.6.28.1.7. Aircrews should release seats to the maximum extent possible, unless the mission set-up from JOSAC or TACC (OCONUS) specifically states No Other Passengers Authorized (NOPA) for that mission. JOSAC or TACC, as applicable, will coordinate with the DV prior to the mission and advise the crew if the DV wishes NOPA.

10.6.31. C-21A Flight Data Recorder Trip and Date Setting Procedures. Set the trip and date recorder as follows:

	TRIP	**C/S**	**DATE**
458 AS	08	Last Two Digits of the Call Sign	Calendar Date of the First Leg of the Mission
311 ALF	11	Same	same
84 ALF	21	Same	same
332 ALF	32	Same	same
457 AS	01	Same	same
47 ALF	47	Same	same
54 ALF	54	Same	same
12 ALF	12	Same	same

EXAMPLE: 458AS, JOSA 123 on 1 Apr should set 08 23 01

10.6.31.3. (Added) Prior to takeoff, use the “Crew Briefing Guide” in the 375 AW IFG.

10.6.34.1. The C-21 is not minimum navigation performance specification (MNPS) compliant.

10.6.41. Use "Crew Briefing Guide" in the 375 AW IFG prior to descent.

10.6.42.4. Alternate Flight Publications. Comply with 375 AW FCB, "Host Government/Jeppesen Instrument Procedures."

10.6.47. Insect and Pest Control. Comply with the AMC Aircrew Border Clearance Guide and paragraphs **10.6.47.4. (Added)** through **10.6.47.6. (Added)**, this supplement.

10.6.47.4. (Added) Insecticide and aerosol deodorant containers will NOT be carried on CONUS missions. For flights to Cuba, Haiti, or other non-CONUS locations, the aircraft commander and medical crew will ensure the insecticide is onboard and available for use to fulfill Department of Agriculture and DOD Foreign Clearance Guide requirements. Fleet Service can be notified through the SCP that insecticide is required, and they will bring it to the aircraft.

10.6.47.5. (Added) These aerosol products contain significant amounts of propane and isobutane, both highly flammable. It is the AC's responsibility to ensure you do not depart with these hazardous materials, unless you are going to a non-CONUS location. The Charge Medical Technician (CMT) or C-21A AC is responsible for ensuring an inventory of supplies brought out by Fleet Service is performed prior to enplaning patients. If the air freshener or insecticide is found among the supplies, they are to be returned to Fleet Service personnel prior to engine start.

10.6.47.6. (Added) The aerosol products are considered hazardous waste and are to be disposed of properly. They are NOT to be thrown into the regular trash. It is costly to dispose of hazardous materials. Therefore, it is imperative you off-load the products at the originating base. If off-load is done at Scott AFB, contact Fleet Service for proper disposal. In addition, any suspected or confirmed hazardous material should be brought to the attention of 375 AW/SE, DSN 576-6311, or 375 OG/CC, DSN 576-3608.

10.7.2. Squadron commanders/flight commanders and operations officers must ensure that aircrews scheduled to participate in a static display review AFI 11-209, Air Force Participation in Aerial Events, and view the 375 AW Airshow Video prior to the static display. During static displays, aircrews should use rope and stanchions to prevent unsupervised/unsecured contact with the aircraft. When the aircraft is attended, rope off from the nose of the aircraft clockwise to the left wing. When the aircraft is unattended, it will be closed and completely encircled with the rope. Aircrews will coordinate with the host unit or their local Security Forces as necessary to obtain rope and stanchions.

10.8.4.2. All items listed in AFI 11-2C-21, Volume 3, Chapter 8, paragraph 8.4.2., will be reported to the SCP as soon as possible after landing. Other events not listed in Chapter 8 which must be reported in an OPREP-3 Homeline Report include: (1) Engine rollbacks; report engine rollback only if rollback exceeds 15 percent N1 or N2 loss, or if the engine fails to respond to manual control; and (2) All unexplained ground engine flameouts.

10.8.4.2.14. Comply with "Aircrew Actions After a Birdstrike" Procedures in the 375 AW FCB.

10.8.5. Notify flight and squadron CC/DO and 375 OG/OGV of any known or possible Air Traffic Control violation as soon as possible after the incident. Provide information using the format in AFI 11-2C-21, Volume 3, Chapter 8, paragraph 8.5. Both pilots will make a detailed written record of the event.

10.9.1.3. (Added) Flying General Instructor Pilot Checkout. Squadron/flight commanders will review the qualifications of assigned and attached crewmembers and will select only highly qualified instructors to perform flying general duties. Ensure that all flying general qualified pilots are trained in accordance with the Flying General Checkout Program outlined in **Attachment 1**. When training is complete, place

this document in the left side of the individual's Flight Evaluation Folder (FEF) and log certification on the AF Form 1381. HQ AMC/DO distributes a list of "General Officers Flying AMC Operational Support Airlift (OSA) Aircraft" to all C-21 units, indicating those general officers authorized to fly the C-21. Flying general instructor pilots will check the general's currency the day prior to the mission by contacting the HOSM where the General's flight records are kept. (NOTE: For the 15AF/CC, contact 15AF/CCA.)

10.9.1.4. (Added) Examiner Certification Process. By definition, the flight examiner position is not a qualification but a certification. The Examiner Upgrade Program will be accomplished IAW Paragraph 7.3.6.2. of the 375 AW Supplement 1 to AFI 11-408/AMC1 and will be recorded using the 375 AW Flight Examiner Worksheet (**Attachment 3** of this supplement).

10.9.1.5. (Added) Refer to 375 AW WOP for approval procedures for all off-station trainers (e.g., training missions which will remain overnight (RON) at other than home station, OCONUS trainers, and airshow/aerial event missions).

10.9.9. Use "Training Briefing Guide" in the 375 AW IFG.

10.17.4. Tactics Flight Training. Threat Avoidance Arrival/Departure (TAA/D) Training. TAA/D Training will be conducted IAW the 15 AF C-21 TAA/D Instructor Guide and C-21A Pilot Training Guide Level III. Pilots upgrading to AC will complete TAA/D Training NLT 60 days after certification as an AC (See paragraph **10.17.4.5. (Added)**, TAA/D Currency Requirements). Units will provide each of the other 375 AW units with copies of procedures and letters of agreement, if required for the airfield that they have developed for the airfields at which they conduct TAA/D Training. Each unit will maintain a Tactics Library Continuity Book containing the procedures for all fields at which C-21 units have procedures established for tactics training. Direct tactics issues to 375 OSS/OST. NOTE: See paragraph **10.4.6. (Added)**, this supplement, for MEL requirements for night TAA/D maneuvers.

10.17.4.5. (Added) TAA/D Currency Requirements.

10.17.4.5.1. MP/FP annual per AFI 11-2C-21V1, Table 4.3. Pilots upgrading to AC will complete TAA/D Training NLT 60 days after certification as an AC.

10.17.4.5.2. IP Semiannual Tactical Proficiency Sortie (XTPS) Requirement.

10.17.4.5.2.1. IPs who received TAA/D certification prior to becoming an IP (i.e., MP/FP) will not instruct TAA/D until logging a day or night XTPS with a TAA/D certified IP.

10.17.4.5.2.2. TAA/D certified IPs must fly or instruct a day or night full TAA/D Profile semiannually.

10.17.4.5.3. Full TAA/D Profile (XTPS) consists of:

Full TAA/D Profile (XTPS) Requirements

1. Spiral-up departure (Tactical Departure)	1. Overhead Approach
2. Random Steep Approaches (Tactical Overhead)	2. Curvilinear Base Approaches (Tactical Base)
2. Curvilinear Downwind Approaches (Tactical Downwind)	

10.20.23. Report any patient medical complications to GPMRC as soon as possible.

2. Functional Check Flight (FCF) Pilot Training Program

3. Flight Evaluator Pilot Upgrade Program
4. C-21A Fuel Conservation Guide
5. 375 AW Guide to OCONUS Operations
6. C-21A High Altitude Airfield Operations
7. Departure Flow Chart
8. 375 OG Commander's Observation Program

Attachment 1

FLYING GENERAL CHECKOUT PROGRAM

Section I- Nomination:

Rank/Name:_____ Type Aircraft:_____

The above-named individual is nominated for entry into the Flying General Training Program.

Maintain this completed form under Tab 1 of the FEF.

_____

DOT Signature/Date

_____

DO Signature/Date

Section II - Training:

Required Training:	**POC:**	**Initials of POC:**	**Date Accomplished:**
1. Review Flying General Techniques with Flying General Instructor Pilot	DOT		
2. Accomplish at least five flying events performing duties as an instructor.	DOT		
3. Observe one mission with an instructor and flying general in the seat. (Squadron CC discretion)	DOT		

Section III - Administration:

Required Action:	**Office of Responsibility**	**Accomplished By:**	**Date:**
Update Flying General Pilot Letter for CC signature	DOT		
Distribute and file copies of new Flying General Pilot Letter	DOT		
Update 1381 with "Flying General Instructor Certification"	DOV		

Section IV - Completion:

_____ _____

Pilot's Signature/Date Unit CC Signature/Date

Attachment 2

FUNCTIONAL CHECK FLIGHT (FCF) PILOT TRAINING PROGRAM

Section I - Nomination:

Rank/Name: _____

The above-named individual is nominated for entry in the FCF Pilot Training Program.

Maintain this completed form under Section 1, Tab 1, of the FEF.

_____ _____

DOV Signature/Date DO Signature/Date

Section II - Training:

Required Training:	**POC:**	**Initials of POC:**	**Date Accomplished:**
Review applicable publications:	DOV		
a. T.O. 1-1-300	DOV		
b. 375 AW 21-102/Local Base Procedures	DOV		
c. T.O. 00-20-5	DOV		
d. T.O. 1C-21A-6CF-1	DOV		
e. T.O. 1C-21A-1	DOV		
f. AFI 11-2C-21,Vol 3	DOV		
Review FCF pilot responsibilities	DOV		
FCF Test Open Book	DOV		
Fly full FCF profile with FCF qualified pilot	Qualified FCF Pilot		

Section III - Administration:

Required Action:	**Office of Responsibility**	**Accomplished By:**	**Date:**
Update FCF Pilot Letter for OG/CC signature	DOV		
Distribute and file copies of new FCF Pilot Letter	DOV		
Update 1381 with "FCF Pilot Certification"	DOV		

Section IV - Completion:

_____ _____

Pilot's Signature/Date Unit CC Signature/Date

Attachment 3

FLIGHT EVALUATOR PILOT UPGRADE PROGRAM

Section I - Nomination:

Rank/Name: _____Type Aircraft: _____

The above-named individual is nominated for entry into the Flight Evaluator Pilot Upgrade Program.

_____DOV Signature/Date

Section II - Training:

Required Training:	POC:	Initials of POC:	Date Accomplished:
Issue applicable publications:	DOV		
a. AFI 11-202, Vol 2	DOV		
b. AFI 11-408/AMC1	DOV		
c. AFI 11-408/375 AW1	DOV		
d. AFI 11-401	DOV		
e. AFI 11-2C-21, Vol 2	DOV		
View EP Upgrade PowerPoint Presentation	DOV		
Complete EP Upgrade Test	DOV		
Receive briefing from unit Chief of DOV and unit CC	DOV/CC		
Fly observation mission on unit administered checkride	DOV/DOS		
Complete Certification Board	DOV		

CC Signature/Date

Section III - Administration:

Required Action:	Office of Responsibility	Accomplished By:	Date:
Update EP Appointment Letter for CC signature	DOV		
Update AF Form 1381and insert this letter in FEF.	DOV		
Complete AMC Form 46 for AFORMS Processing	DOV		

Required Action:	Office of Responsibility	Accomplished By:	Date:
Fax copy of EP Appointment Letter to SQ/DOV and 375 OG	DOV		

Section IV - Completion:

_____ _____

Pilot's Signature/Date DOV Signature/Date

Attachment 4

C-21A FUEL CONSERVATION GUIDE

A4.1. The primary purpose of this guide is obviously fuel savings. Admittedly, the C-21 is a fuel-efficient aircraft and mission restrictions preclude implementation of fuel savings techniques on each mission segment. The amount of fuel we can save is small when compared to larger aircraft in the Air Force inventory; however, each little bit helps. Although the C-21 is your current assignment, the fuel conservation mindset you develop here will carry over to other aircraft where fuel saving techniques pay bigger dividends. Knowledge of these techniques will also prove invaluable on a minimum fuel diversion where saving fuel is essential. Remember that safety and mission accomplishment always eclipse fuel savings as priorities. You should, however, make every effort to conserve when possible.

A4.2. FLIGHT PLANNING:

A4.2.1. The basic rule is that it costs fuel to carry fuel. Carrying extra fuel results in: (1) increased take-off and climb fuel, and (2) lower cruise ceiling and resultant higher fuel burn. Then, this increased fuel usage requires additional fuel required for holding and an alternate that effects fuel load. As a rule of thumb, you will burn 3 percent of the extra fuel you carry per hour. For a C-21 with 1000 lbs of extra fuel, 60 lbs will be used on a 2-hour sortie and approximately 120 lbs will be used on a 4-hour flight. Our computer flight plans provide a required ramp fuel load that is essentially the minimum fuel required for the sortie. Theoretically, any fuel carried beyond the required is excess weight. It is important to remember what the required ramp fuel consists of and what it fails to consider when making fuel conscious decisions. Required ramp fuel consists of: en route fuel, reserve fuel (if required), approach and missed approach fuel (if required), holding fuel, approach and landing fuel, and any identified extra fuel.

Remember to take into account fuel you may need for weather deviations and fuel ATC may cost you by delaying an immediate climb to your cruising altitude. The point here is that "Wings and Tips" fuel planning mentality is normally excessive. Take an extra minute or two and evaluate how much fuel you actually need to safely accomplish your mission to avoid hauling extra ballast around the country. The computer flight plans that we receive are optimized for forecast winds, aircraft performance, airspace structure, and user inputs. Recognize that optimum routing (both fuel and time) may not be the most direct routing due to winds aloft. The suggestion here is that you should file and fly the CFP as closely as possible, both in altitude and route. This method will not only allow you to use the winds to your advantage, but also allows accurate comparisons between actual and computed fuel usage.

A4.3. INFLIGHT OPERATIONS:

A4.3.1. Altitude and cruise speeds are the two factors, which have the greatest affect on your fuel burn at altitude. The greatest potential for fuel savings exists here, since the majority of time is spent at cruise. Climbing to higher altitudes yields the advantages of more NMs per pound of fuel and a longer time on the descent profile. Referring to the C-21 Specific Range Chart, the maximum NMs per pound of fuel varies with aircraft weight. At 18,000 lbs, maximum specific range occurs at approximately FL390, and by 12,000 lbs, maximum specific range occurs at FL450. Also, note at 12,000 lbs, the C-21 burns almost 36 percent less fuel per mile, demonstrating how excess weight diminishes fuel economy. The Specific Range Chart is based upon ISA Temperatures at altitude and variations from ISA will correspondingly affect the optimal cruise altitude. Temperatures above ISA will lower the optimal altitude (by approximately 2,000' for ISA+15), while cooler temperatures will increase optimal cruise altitude (by approximately 1,000' for ISA-15). As a general rule, it is always better to climb if all things are equal. Achieving

a higher cruise altitude, even if only for a few minutes, will save fuel. The fuel spent climbing will be more than offset by a lower fuel burn at the new altitude and the longer en route descent.

A4.3.2. The selection of cruise speed is another important decision you can make regarding fuel conservation during the en route phase. Take for example the following typical missions flown at FL390 and ISA Temperature for a gross weight of 15,500 lbs:

	400 NM Cruise Leg	800 NM Cruise Leg
Normal Cruise		
En route Time	0+56	1+52
Fuel Burn	1051 lbs	2102 lbs
Long Range		
En route Time	0+59	1+58
Fuel Burn	1003 lbs	2006 lbs
Fuel Saved	5%	5%
High Speed Cruise		
En route Time	0+53	1+46
Fuel Burn	1170 lbs	2342 lbs
Fuel Wasted	11%	11%

You can easily see that considerable fuel savings exist through the use of long-range cruise profiles, while significant fuel penalties occur by flying a high-speed profile. NOTE: The mission en route time varies by only a few minutes depending upon the profile flown. The point here is that fuel savings can be significant while the time differences in the profiles are minimal. Remember that your long-range cruise speed varies with weight. Therefore, it is important to update your cruise speed as weight changes. As always, keep in mind DV requirements and mission impact when planning the profile to fly.

A4.4. DESCENT, APPROACH, AND LANDING:

A4.4.1. Proper descent planning will also save fuel. It is most efficient to cover distance as high as possible and then make an idle power descent to landing. This approach, however, has practical limitations such as ATC speed and altitude requirements, weather, etc. The C-21A-1 Descent Performance Schedule provides a good no wind plan for descent. In the real world, winds significantly affect your planning. Use the GPS for time to your destination and plan that you can easily achieve 2,000'/min descent between FL450 and FL310 and the 3,000'/min thereafter. For example, a descent from FL 390 to sea level should optimally begin about 15- minutes out from your destination. Using time is superior to the "Three Times Altitude" technique, since winds are accounted for. Consider whether or not you need to fly to the other side of the field for the approach and take that into account when deciding on a descent point. Plan to accomplish crossing restrictions with an idle power descent arriving at the fix no earlier than 10 NM prior, if practical.

A4.4.2. Approach and landing fuel can also be minimized by prior planning. The big factors in regard to this phase of flight are time-configured and time spent at low altitude. Consider that fuel flow configured is approximately 50 to 60 percent greater than clean. Therefore, configuring closer to the FAF is advantageous. Don't delay configuring to the point of being unsafe or causing a missed approach. The miss

will cost you more fuel than the extra mile dirty. A visual approach can save time and fuel if weather and conditions permit. Plan your approach and landing to a runway which will minimize taxi distance, if practical.

A4.5. As a final word, fuel conservation should always be a consideration. Always ensure enough fuel is available for planned flight time, with appropriate reserves. Never put yourself is a position where a lack of fuel forces a bad decision or unnecessary disruption to the mission.

Attachment 5

375 AW GUIDE TO OCONUS OPERATIONS

A5.1. This guide should aid aircrews in preparation for operating outside the CONUS. It is not meant to replace currently published documents such as FLIP, Foreign Clearance Guide, AFIs, Multi-Command or AMC Instructions.

A5.2. Information on hazards, restrictions, and limitations not found in other publications is solicited from all operators. All units/personnel are tasked to submit pertinent data for updating this summary whenever a condition is identified which will adversely affect our operation. After each scheduled mission outside the CONUS (except Canada), submit to HQ AMC/TACC/XOO, DOA and DOV an after-action report with a brief description of minor problems and items of interest. For 375 AW- or 932 AW-generated missions, submit a report to OGV only.

A5.3. General Information. It is important that you research all of the airfields you will transit, to include possible alternates. Since DOD Approach Plates provide only limited coverage of Central and South America, Caribbean and some European international airfields, you may need to obtain Jeppesen Approach Plates. DOD coverage may include some approaches to the airfield(s) you will transit, but not to all runways available. In some cases, DOD has a published nonprecision approach to an airfield when Jeppesen has an ILS. Jeppesens are maintained at HQ AMC/DOT for emergency use only. Crews must arrange for their own Jeppesens through local purchase. Jeppesens are approved for use in IFR only when specifically cited by HQ AMC. Usually only one or two Jeppesen procedures are approved for a field and they often involve following HQ AMC- imposed restrictions. Approval information is available through the internet at www.gdss.safb.af.mil.

A5.3.1. Certification/Restricted Airfields. HQ AMC Airfield Suitability and Restrictions Report (ASRR) has designated certain fields as certification, restricted, or daylight only due to unique hazards or operating procedures. Crews may also call an AMC Command Post or TACC for the latest changes and updates that are available from GDSS or access the GDSS Database at www.gdss.safb.af.mil. NOTE: See paragraphs **10.5.15.3.4. (Added)** through **10.5.15.5.**, this supplement, for additional 375 AW imposed ASRR Restrictions.

A5.3.2. There are many additional sources for information about non-CONUS airfields. Units should maintain continuity books containing information such as parking location, hotels, transportation, etc., to help future crews. This information should be updated as part of after-action reports provided by each crew. The 375 OG/OGV will file these reports and can provide a summary of this information on request. Trip reports are available on the 375 OGV Home Page at www.scott.af.mil/375aw/375og/375ogv/ogvhome.htm.

A5.3.3. Command and Control. Aircrews will pass command and control information as directed to HQ AMC/TACC. USAF Global HF/SSB Stations listed in FLIP includes a chart depicting areas of coverage and suggested frequency band selection based upon time of day. Keep in mind that atmospheric and other factors affect reception, making it necessary to attempt contact on all available frequencies. On the ground, you can call your controlling agency from embassies, consulates, or have them send a message to HQ AMC/TACC/XOPE/XOPN for you.

A5.3.4. Many ATC agencies, particularly those operating a nonradar facility, do not have the capability to quickly translate coordinates in a position report. With the exception of Oceanic Position Reports, when asked for your position, it is usually easier to give your position as a radial and DME from a navigation

aid or point on an airway rather than LAT/LONG from your UNS/GPS/INS. Coordinates are appropriate when passing a PIREP to weather personnel whom may not be familiar with navaids by name.

A5.3.5. Be prepared for communication difficulties. Language barriers, accents, and unfamiliar names make radio communication a challenge. Some techniques for minimizing problems are:

A5.3.5.1. Monitor the radios closely. If you do not hear the controller for some time, try a radio check.

A5.3.5.2. Monitor your position on the en route charts. As you approach FIR/UIR and sector boundaries, expect a frequency change. If this does not happen, query the controller. En route charts usually have the sector controller's frequencies annotated on them.

A5.3.5.3. If you are unable to raise the controller, try disabling the Squelch function on your radio. You can also attempt a relay with another aircraft on frequency. Many regions have listed a VHF Frequency that is monitored by other aircraft operating within that area and can offer assistance with relaying information and position reports.

A5.3.5.4. If you have two VHF Radios, set the one not in use to VHF guard and monitor it. Many foreign civil ATC facilities do not use UHF guard. If you are in a bind, UHF guard may at least get you in contact with a military facility that can relay information or get a usable VHF Frequency for you.

A5.3.5.5. Be prepared when calling a new agency. Have a position report prepared, especially if you are operating in a nonradar environment. Being familiar with your filed routing and navaids along your route will make it easier to copy clearances and re-routes.

A5.3.6. Aircrews will carry Terrain Charts for intended destinations.

A5.4. Flight Planning. While this guide cannot provide an all-inclusive checklist for flight planning, it will attempt to highlight several publications and some of the shortcomings and special emphasis items to address during the planning phase of your mission.

A5.4.1. Mission Tasking. If diplomatic clearance is required for the routing, destination(s), or alternate(s), the clearance number and routing specified in the diplomatic clearance request should be available to the crew. Some airports cannot be used as alternates and this may be published in the IFR Supplement, Area Planning or Foreign Clearance Guide. The diplomatically cleared routing may not be the preferred or standard routing. This could be because of political reasons or simply because the person sending the clearance request was not aware of preferred routings. If time permits and a routing is specified in your diplomatic clearance, try to ensure that the computer flight plan request includes your cleared routing. In any event, file and fly the routing specified in the diplomatic clearance. The diplomatic may also specify the use of a special call sign. If so, this call sign will be used and filed on the flight plan for that particular leg.

A5.4.2. Foreign Clearance Guide. Check both the unclassified and classified editions for your destination and for countries you will overfly along your route. Ensure that you are entering the destination country at an Aerodrome of Entry, at a time when Customs is available and that you will have the required paperwork for Customs and Immigration. Also, check the valid time for diplomatic clearances if needed. Some are valid from 0001L on the date requested and early or late arrival is no problem. Others are valid for meeting the requested time at the FIR boundary, no earlier. The expiration times vary and may be by date, requested time + 24 hours or longer. Look for restrictions to imports and other limitations that you may need to brief to your passengers, such as no photography on the flight line or whether military or civilian government employees require an official passport or visa. A handy item to jot down is the phone number of the embassy, consulate, or defense attache in that country. They can be very helpful when

scheduling changes, maintenance, or other problems arise and you need access to DSN to contact your controlling agency. The FCG also addresses spraying for insects before landing. If you need to spray, be sure you get the proper insecticide before leaving home.

A5.4.3. FLIP Area Planning. Use the volume that is appropriate for the area of operation. Check Section A, Regional Supplementary Procedures, Section B, FIR/UIR Supplementary Procedures and Section C, National Supplementary Procedures for the country you are traveling to and for those you overfly. Look for any special flight planning information, such as required remarks on flight plans, ETAs for boundaries that may be required, and transponder settings to be used. The Route and Area Restrictions Section and Additional Information Sections contain information applicable to overflight and when landing in that country. Finally, Supplementary Airport Remarks may be published for your destination or alternate. In some cases, the preferred routing between two countries is published in the listing for the country you overfly. Because information is spread out between the three sections and under many titles, Area Planning is full of "gotcha" types of information. A great example is a required radio call 5 minutes prior to entering Barranguilla FIR (Columbia). "ATC will not offer safe control over aircraft that do not comply." You may easily miss that as it is buried under the heading "Position Reporting" in National Supplementary Procedures for Columbia. Don't forget the Planning Change Notices filed in the front of the book. They are published every 8 weeks and are cumulative; that is, 16 weeks after a new Area Planning is published, there will be two PCNs to check until the next AP comes out at the 24-week point.

A5.4.4. Once you have studied all of FLIP, FCG, etc., you will find yourself with a wealth of information. One tip to ensure making the right radio calls and squawking the right codes is to highlight points on your computer flight plan or AF Form 70 and note the requirements in the margin. It can also be helpful to take a few extra minutes when preparing for descent and review your notes on the destination to be sure you are prepared not only for the approach and landing, but also for your reception by Customs and Immigration officials at your destination.

A5.4.5. Intelligence. Arrange for an Intelligence Briefing before your flight. Try to set this briefing up as soon as you know about the mission to give the Intelligence personnel time to adequately research your destination. AFI 11-401/AMC1 requires the aircraft commander to certify that he/she has reviewed the Airfield Threat File. This review is done by initialing and dating your FCIF Card. (AUTH: 375 OG/CC.)

Attachment 6

C-21A HIGH ALTITUDE AIRFIELD OPERATIONS

The following procedures are for operations at airfields from approximately 8,000 ft pressure altitude up to 10,000 ft pressure altitude. Reference the Pressurization System Description in Section I and Emergency Procedures in Section III for further information.

A6.1. Passengers should be given a thorough briefing on the pressurization abnormalities to expect on arrival and departure. With these procedures, rapid changes in the cabin pressure will be experienced. Passengers should be briefed on how to clear their ears and warned of problems that may be encountered if they have sinus congestion. They should also expect a large volume of noise and hot air if the pressure altitude at the field is greater than 9,250 ft.

A6.2. ENGINE START AND TAXI. Engine start should be accomplished with the Pressurization Automatic-Manual Switch in MAN. Engine start should be normal at pressure altitudes below 9,250 ft. For engine starts above 9,250 ft pressure altitude, start the engines with the Bleed Air Switches off to prevent emergency airflow into the cabin. N_1 and N_2 idle RPM indications will be higher. Cabin air should be turned on normally during the Taxi Checklist.

A6.3. TAKEOFF:

A6.3.1. Pressure altitude less than 9,250 ft: Takeoff with the pressurization system in the manual mode, cabin air on, and the Bleed Air Switches on. The Cabin Altitude Light will be on above approximately 8,500 ft pressure altitude. After liftoff, the copilot should raise the gear upon command of the pilot. Simultaneously, with the other hand, the copilot should use the Up/Dn Manual Control Switch to decrease the cabin altitude to below 7,200 ft and return the pressurization system to automatic mode by placing the Automatic-Manual Switch to AUTO.

A6.3.2. Pressure altitude greater than 9,250 ft: Takeoff with the pressurization system in the manual mode, cabin air on, and the Bleed Air Switches off. The Cabin Altitude Light will be on. Pressurization will have to be re-established after once airborne. After liftoff, the copilot should raise the gear upon command of the pilot. Simultaneously, with the other hand, the copilot should turn the Right Bleed Air Switch on and use the Up/Dn Manual Control Switch to decrease the cabin altitude to below 9,500 ft. Recycle the Right Bleed Air Switch from ON to OFF and then back to ON to reset the Emergency Pressurization Valves. Continue to decrease the cabin altitude to below 7,200 ft and return the pressurization system to automatic mode by placing the Automatic-Manual Switch to AUTO. Turn the Left Bleed Air Switch on.

A6.4. APPROACH. Set the Cabin Controller to its maximum; then, place the Pressurization Auto-Manual Switch to manual prior to landing. Use the Up/Dn Manual Control Switch to raise the cabin altitude to field elevation. If landing at or above 9,500 ft pressure altitude, turn off the Bleed Air Switches to prevent emergency airflow.

A6.5. LANDING. Follow normal landing procedures. At touchdown, expect the primary outflow valve to fully open and dump any remaining pressure. During the After Landing Checklist, turn the Cabin Air Switch off in the normal sequence. The Cabin Safety Valve will open, and further ensure that the cabin is unpressurized before opening the door.

Attachment 7

DEPARTURE FLOW CHART

To depart IFR, either from initial takeoff or from a touch-and-go to radar control, the following conditions must be met:

A7.1. A published (DoD, NOAA, or AMC-approved Jeppesen) instrument approach must exist which ensures the field was TERPed.

A7.2. If a published departure procedure (any 'Trouble T' or Jeppesen listed procedure) has alternate takeoff weather minimums, the words "standard" or "or standard" (usually associated with a minimum climb gradient) must also be listed for that runway or you cannot depart IFR (except via a SID w/ a published climb gradient).

A7.3. You must guarantee engine-out obstacle clearance either through direct calculation (of 'Trouble T'-noted obstacles or other known obstacles) or by subtracting 48'/NM buffer from the applicable published gradient. However, maintaining this additional 48'/NM buffer is recommended. NOTE: Obstacles under 200' AGL may require manual gradient computation that must be met. (Refer to paragraph **10.6.16.2.2.**, NOTE 2, this supplement.) Depart using one of the following four methods.

A7.3.1. Standard Instrument Departure (SID) (REF: paragraph **10.6.16.2.1.**)

A7.3.1.1. If there is no SID gradient or 'Trouble T' gradient, the gradient that must be met is 200'/NM.

A7.3.1.2. If there is no SID gradient and a 'Trouble T' gradient exists, the 'Trouble T' gradient must be met.

A7.3.1.3. If a SID gradient exists, either with or without a 'Trouble T' gradient, the SID gradient must be met.

A7.3.2. Instrument Departure Procedure (IDP) (REF: paragraph **10.6.16.2.2.**)

A7.3.2.1. This method is descriptive and is published under the 'Trouble T.'.

A7.3.2.2. The gradient that must be met is the greater of 200'/NM or as 'Trouble T'-published.

A7.3.2.3. If published routing exists it must be flown.

A7.3.3. Radar Vector Departure (RVD) i.e., Specific ATC Instructions (REF: paragraph **10.6.16.2.3.**)

A7.3.3.1. The gradient that must be met is the greater of 200'/NM, as 'Trouble T'-published, or as SID-published.

NOTE: The aircrew is responsible for obstacle clearance until a radar vector is issued. The term "Radar Contact" means only the aircrew has been identified on radar and does not mean that ATC assumes obstacle clearance responsibility. Obstacle avoidance responsibility is shared between ATC and the aircrew once a radar vector is issued (e.g., "Swift 51, radar contact, turn left heading 090" or "Smoky 23, fly present heading, climb and maintain 10,000 ft").

A7.3.4. Diverse Departure (DD) (REF: paragraph **10.6.16.2.4.**)

A7.3.4.1. The gradient that must be met is 200'/NM, unless a higher gradient is published (then it is an IDP).

A7.3.4.2. This method expects the required gradient to be met all the way to the IFR MEA.

A7.3.4.3. This method is N/A if the airfield has been USN or is OCONUS USA TERPed.

A7.3.4.4. This method is N/A if the airfield has a published IDP routing-you are then flying an IDP.

A7.4. If you are unable to comply with any of these departure methods, you may consider downloading fuel, cargo, or waiting for climatological conditions to improve.

A7.5. If you are still unable to comply with any of these departure methods, you may consider using the Alternate IFR Departure Method or you cannot depart IFR.

A7.6. Alternate IFR Departure Method (All must be met) (REF: paragraph **10.6.16.2.5. (Added)**)

A7.6.1. Day/VMC exists for the entire emergency return route and departure route to an IFR MEA to be flown using Visual Flight Rule (VFR) Cloud Clearances.

A7.6.2. All engines operating meets the greater of 200'/NM or the published gradient.

A7.6.3. The AC, after thorough analysis (using applicable obstacle height and distance information from available sources including the airfield manager, base operations, JOGs, TPCs, sectionals, etc,) determines that in the event of engine failure, the planned departure and emergency route allow for obstacle clearance.

A7.6.4. The emergency route back to the departure field or to the alternate departure field must be planned and briefed to the entire crew.

A7.6.5. If an engine failure occurs, aircrews planning to continue their filed departure procedures must advise ATC if they are unable to meet the published ATC or obstacle climb gradient.

A7.7. VFR departures do not relieve you of ensuring obstacle clearance. (REF: paragraph **10.6.16.2.6.**)

Attachment 8

375 OG COMMANDER'S OBSERVATION PROGRAM

A8.1. As commanders, we must know our people and their abilities. The observation of our folk's training and performing the mission provides very valuable insight into our readiness and helps give us a better understanding of our people's needs and our capabilities.

A8.2. Per the 375 OG Employment Training Plan, commanders at each level (squadron and flight) should observe each of their aircrew members actively performing mission duties once each calendar year. A critical focus is our upgrade training process. Observations may be accomplished while flying as a primary or additional crewmember. However, this program is separate from our standardization program, including scheduled evaluations. These observations may be administered in conjunction with a flight evaluation, but are not a substitute for flight evaluations. Therefore, do not use an AF Form 8 to document observation results.

A8.3. Each squadron and flight commander will maintain a roster of assigned personnel as the basis for logging observations. This roster should contain the names of all personnel assigned to the unit during the year. By the fifth duty day of each quarter, forward to 375 OG/OGV the number of observations accomplished and the total number of people that has been assigned to your unit during the year. (Unit DOVs will provide inputs on **Attachment 1** to the 375 AW Supplement to AFI 11-408/AMC1). Due to the size of the 375 AES, the squadron commander may delegate this responsibility to the Director of Operations, superintendent, and other designated flight commanders. While several commanders may fly with the same crewmember, only one commander is permitted to take credit for the observation. In addition, if you fly with a crewmember in January and then again in August, you are only allowed to take credit for the January mission. The OGV will consolidate inputs from squadron and flight commanders for presentation at the quarterly Standardization/Evaluation Board.

A8.4. The upgrade training process will be a critical focus during the observation period. Prime examples are: Instructors teaching on-line and local missions; examiners administering evaluations; ACs training copilots via pilot training guides; and aircrews conducting Crew Resource Management Training Missions.

A8.5. Although time is often scarce, squadron commanders are encouraged to observe aircrews from their GSUs as much as possible. The 375th Operations Group Commander Observation Program will help us keep our finger on the pulse of operations and identify areas for improvement.

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